

MLLNVLRICI	IVCLVNDGAG	KHSEGRERTK	TYSLNSRGYF	40
RKERGARRSK	ILLVNTKGLD	EPHIGHGDFG	LVAELFDSTR	80
THTNRKEPDM	NKVKLFSTVA	HG <u>NK</u> SARRKA	Y <u>NG</u> SRRNIFS	120
RRSFDKRNTE	VTEKPGAKMF	WNNFLVKMNG	AP <u>ONT</u> SHGSK	160
AQEIMKEACK	TLPFTQNIVH	ENCDRMVIQN	NLCFGKCISL	200
HVPNQQDRRN	TCSHCLPSKF	TLNHLTL <u>NCT</u>	GSKNVVKVVM	240
MVEECTCEAH	KSNFHQTAQF	NMDTSTTLHH		270

Figure 1. Deduced amino acid sequence of *Xenopus cerberus* protein. SEQ ID NO:1.

Figure 2. Nucleotide sequence of the full-length cerberus DNA derived from the *Xenopus* organizer. The sense strand is on top (in the 5' to 3' direction) and the antisense strand on the bottom line (on the opposite direction). SEQ ID NO:2.

GAATTCCTCAG CAAGTCGCTC AGAAACACTG CAGGGTCTAG ATATCATACA ATGTTACTAA	60
CTTAAGGGTC GTTCAGCGAG TCTTTGTGAC GTCACGATC TATAGTATGT TACAATGATT	
ATGTACTCAG GATCTGTATT ATCGTCTGCC TTGTGAATGA TGGAGCAGGA AAACACTCAG	120
TACATGAGTC CTAGACATAA TAGCAGACGG AACACTTACT ACCTCGTCTT TTTGTGAGTC	
AAGGACGAGA AAGGACAAAA ACATATTCAC TTAACAGCAG AGGTACTTTC AGAAAAGAAA	180
TTCTTGCTCT TTCCTGTTTT TGTATAAGTG AATTGTCGTC TCCAATGAAG TCTTTTCTTT	
GAGGAGCAGC TAGGAGCAAG ATTCTGCTGG TGAATACTAA AGGTCTTGAT GAACCCACAC	240
CTCCTCGTGC ATCTCGTTC TAAGACGACC ACTTATGATT TCCAGAACTA CTTGGGGTGT	
TTGGGCATGG TGATTTTCGC TTAGTAGCTG AACTATTTGA TTCCACCAGA ACACATACAA	300
AACCGTACC ACTAAAAGCG AATCATCGAC TTGATAAACT AAGGTGGTCT TGTGTATGTT	
ACAGAAAAGA GCCAGACATG AACAAAGTCA AGCTTTTCTC AACAGTTGCC CATGGAAACA	360
TGCTTTTCTT CGGTCTGTAC TTGTTTCAGT TCGAAAAGAG TTGTCAACGG GTACCTTTGT	
AAAGTGCAAG AAGAAAAGCT TACAATGGTT CTAGAAGGAA TATTTTTCCT CGCCGTTCTT	420
TTTCACGTTT TTCTTTTCGA ATGTTACCAA GATCTTCCTT ATAAAAAGGA GCGGCAAGAA	
TTGATAAAAG AAATACAGAG GTTACTGAAA AGCCTGGTGC CAAGATGTTT TGGAACAATT	480
AACTATTTTC TTTATGCTTC CAATGACTTT TCGGACCACG GTTCTACAAG ACCTTGTTAA	
TTTTGGTTAA AATGAATGGA GCCCCACAGA ATACAAGCCA TGGCAGTAAA GCACAGGAAA	540
AAAACCAATT TACTTTACCT CGGGGTGTCT TATGTTCCGT ACCGTCATTT CGTGTCCTTT	
TAATGAAAGA AGCTTGCAAA ACCTTGTTTT TCACTCAGAA TATTGTACAT GAAACTGTG	600
ATTACTTTCT TCGAACGTTT TGGAAACAAA AGTGAGTCTT ATAACATGTA CTTTGTGAC	
ACAGGATGGT GATACAGAAC AATCTGTGCT TTGGTAAATG CATCTCTCTC CATGTTCCAA	660
TGCTCTACCA CTATGTCTTG TTAGACACGA AACCATTAC GTAGAGAGAG GTACAAGGTT	
ATCAGCAAGA TCGACGAAAT ACTTGTTCCC ATTGCTTGCC GTCCAAATTT ACCCTGAACC	720
TAGTCGTTCT AGCTGCTTTA TGAACAAGGG TAACGAACGG CAGGTTTAAA TGGGACTTGG	
ACCTGACGCT GAATTGTACT GGATCTAAGA ATGTAGTAAA GGTTGTCATG ATGGTAGAGG	780
TGGACTGCGA CTTAACATGA CCTAGATTCT TACATCATT CCAACAGTAC TACCATCTCC	
AATGCACGTG TGAAGCTCAT AAGAGCAACT TCCACCAAAC TGCACAGTTT AACATGGATA	840
TTACGTGCAC ACTTCGAGTA TTCTCGTTGA AGGTGGTTTG ACGTGTCAA TTGTACCTAT	
CATCTACTAC CCTGCACCAT TAAAGGACTG CCATACAGTA TGGAAATGCC CTTTGTGTTG	900
GTAGATGATG GGACGTGGTA ATTTCTGAC GGTATGTCAT ACCTTTACGG GAAACAACC	
AATATTTGTT ACATACTATG CATCTAAAGC ATTATGTTGC CTTCTATTTT ATATAACCAC	960
TTATAACAA TGTATGATAC GTAGATTTTC TAATACAACG GAAGATAAAG TATATTGGTG	
ATGGAATAAG GATTGTATGA ATTATAATTA ACAAATGGCA TTTTGTGTAA CATGCAAGAT	1020
TACCTTATTC CTAACATACT TAATATTAAT TGTTTACCGT AAAACACATT GTACGTTCTA	

CTCTGTTCCA	TCAGTTGCAA	GATAAAAGGC	AATATTTGTT	TGACTTTTTT	TCTACAAAAT	1080
GAGACAAGGT	AGTCAACGTT	CTATTTTCCG	TTATAAACAA	ACTGAAAAAA	AGATGTTTTA	
GAATACCCAA	ATATATGATA	AGATAATGGG	GTCAAAACTG	TTAAGGGGTA	ATGTAATAAT	1140
CTTATGGGTT	TATATACTAT	TCTATTACCC	CAGTTTGTGAC	AATTCCCCAT	TACATTATTA	
AGGGACTAAG	TTTGCCCAGG	AGCAGTGACC	CATAACAACC	AATCAGCAGG	TATGATTTAC	1200
TCCCTGATTC	AAACGGGTCC	TCGTCACTGG	GTATTGTTGG	TTAGTCGTCC	ATACTAAATG	
TGGTCACCTG	TTTAAAAGCA	AACATCTTAT	TGGTTGCTAT	GGGTTACTGC	TTCTGGGCAA	1260
ACCAGTGGAC	AAATTTTCGT	TTGTAGAATA	ACCAACGATA	CCCAATGACG	AAGACCCGTT	
AATGTGTGCC	TCATAGGGGG	GTTAGTGTGT	TGTGTACTGA	ATAAATTGTA	TTTATTTTCAT	1320
TTACACACGG	AGTATCCCCC	CAATCACACA	ACACATGACT	TATTTAACAT	AAATAAAGTA	
TGTTACAAAA	AAAAAATA					
ACAATGTTTT	TTTTTTTT					

Fig. 2. (Continuation page 2, SEQ ID NO:2).

MSRTRKVDL LLLAIPGLAL LLLPNAYCAS CEPVRIPMCK SMPWNMTKMP NHLHHSTQAN 60
AILAIEQFEG LLTTECSQDL LFFLCAMYAP ICTIDFQHEP IKPCKSV CER ARAGCEPILI 120
KYRHTWPESL ACEELPVYDR GVCISPEAIV TVEQGTDSMP DFSMDSNNGN CGSGREHCKC 180
KPMKATQKTY LKNNYNYVIR AKVKEVKVKC HDATAIVEVK EILKSSLVNI PKDTVTLYTN 240
SGCLCPQLVA NEEYIIMGYE DKERTRLLLV EGS LAEKWRD RLAKKVKRWD QKLRRPRKSK 300
DPVAPIPNKN SNSRQARS

Figure 3. Deduced amino acid sequence of Xenopus frazzled protein. SEQ ID NO:3.

Figure 4. Nucleotide sequence of the full-length frazzled cDNA derived from the *Xenopus* organizer. The sense strand of the DNA on top (5' to 3' direction) and the antisense strand on the bottom line (opposite direction). SEQ ID NO:4.

GAATTCCTT TCACACAGGA CTCCTGGCAG AGGTGAATGG TTAGCCCTAT GGATTGTT	60
CTTAAGGGAA AGTGTGTCTT GAGGACCGTC TCCACTTACC AATCGGGATA CCTAAACCAA	
TGTTGATTTT GACACATGAT TGATTGCTTT CAGATAGGAT TGAAGGACTT GGATTTTAT	120
ACAACTAAAA CTGTGTACTA ACTAACGAAA GTCTATCCTA ACTTCCTGAA CCTAAAAATA	
CTAATTCTGC ACTTTTAAAT TATCTGAGTA ATTGTTTATT TTGTATTGGA TGGGACTAAA	180
GATTAAGACG TGAAAATTTA ATAGACTCAT TAACAAGTAA AACATAACCT ACCCTGATTT	
GATAAACTTA ACTCCTTGCT TTTGACTTGC CCATAAACTA TAAGGTGGGG TGAGTTGTAG	240
CTATTTGAAT TGAGGAACGA AAACGTAACG GGTATTTGAT ATTCCACCCC ACTCAACATC	
TTGCTTTTAC ATGTGCCAG ATTTCCCTG TATTCCCTGT ATTCCCTCTA AAGTAAGCCT	300
AACGAAAATG TACACGGGTC TAAAAGGGAC ATAAGGGACA TAAGGGAGAT TTCATTCCGA	
ACACATACAG GTTGGGCAGA ATAACAATGT CTCGAACAAG GAAAGTGGAC TCATTACTGC	360
TGTGTATGTC CAACCCGTCT TATTGTTACA GAGCTTGTTT CTTTCACCTG AGTAATGACG	
TACTGGCCAT ACCTGGACTG GCGCTTCTCT TATTACCCAA TGCTTACTGT GCTTCGTGTG	420
ATGACCGGTA TGGACCTGAC CGCGAAGAGA ATAATGGGTT ACGAATGACA CGAAGCACAC	
AGCCTGTGCG GATCCCCATG TGCAAATCTA TGCCATGGAA CATGACCAAG ATGCCCAACC	480
TCGGACACGC CTAGGGGTAC ACGTTTAGAT ACGGTACCTT GTACTGGTTC TACGGGTTGG	
ATCTCCACCA CAGCACTCAA GCCAATGCCA TCCTGGCAAT TGAACAGTTT GAAGGTTTGC	540
TAGAGGTGGT GTCGTGAGTT CGGTTACGGT AGGACCGTTA ACTTGTCAAA CTTCCAAACG	
TGACCACTGA ATGTAGCCAG GACCTTTTGT TCTTCTGTG TGCCATGTAT GCCCCATT	600
ACTGGTGAAT TACATCGGTC CTGGAAAACA AGAAAGACAC ACGGTACATA CGGGGGTAAA	
GTACCATCGA TTTCCAGCAT GAACCAATTA AGCCTTGCAA GTCCGTGTGC GAAAGGGCCA	660
CATGGTAGCT AAAGGTCGTA CTTGGTTAAT TCGGAACGTT CAGGCACACG CTTTCCCGT	
GGGCCGGCTG TGAGCCCATC CTCATAAAGT ACCGGCACAC TTGGCCAGAG AGCCTGGCAT	720
CCCGGCCGAC ACTCGGGTAA GAGTATTTC TGGCCGTGTG AACCGGTCTC TCGGACGTA	
GTGAAGAGCT GCGCGTATAT GACAGAGGAG TCTGCATCTC CCCAGAGGCT ATCGTCACAG	780
CACTTCTCGA CGGGCATATA CTGTCTCTC AGACGTAGAG GGGTCTCCGA TAGCAGTGTC	
TGGAACAAGG AACAGATTCA ATGCCAGACT TCTCCATGGA TTCAAACAAT GGAAATTGCG	840
ACCTTGTTCC TTGTCTAAGT TACGGTCTGA AGAGGTACCT AAGTTTGTTA CCTTTAACGC	
GAAGCGGCAG GGAGCACTGT AAATGCAAGC CCATGAAGGC AACCCAAAAG ACGTATCTCA	900
CTTCGCCGTC CCTCGTGACA TTTACGTTTC GGTACTTCCG TTGGGTTTTT TGCATAGAGT	
AGAATAATTA CAATTATGTA ATCAGAGCAA AAGTGAAAGA GGTGAAAGTG AAATGCCACG	960
TCTTATTAAT GTTAATACAT TAGTCTCGTT TTCACCTTCT CCACTTTCAC TTTACGGTGC	
ACGCAACAGC AATTGTGGAA GTAAAGGAGA TTCTCAAGTC TTCCCTAGTG AACATTCTTA	1020
TGCGTTGTGC TTAACACCTT CATTTCTCTT AAGAGTTCAG AAGGGATCAC TTGTAAGGAT	

AAGACACAGT GACACTGTAC ACCAACTCAG GCTGCTTGTG CCCCAGCTT GTTGCCAATG 1080
 TTCTGTGTCA CTGTGACATG TGGTTGAGTC CGACGAACAC GGGGGTCGAA CAACGGTTAC
 AGGAATACAT AATTATGGGC TATGAAGACA AAGAGCGTAC CAGGCTTCTA CTAGTGGAAG 1140
 TCCTTATGTA TTAATACCCG ATACTTCTGT TTCTCGCATG GTCCGAAGAT GATCACCTTC
 GATCCTTGGC CGAAAAATGG AGAGATCGTC TTGCTAAGAA AGTCAAGCGC TGGGATCAAA 1200
 CTAGGAACCG GCTTTTTTACC TCTCTAGCAG AACGATTCTT TCAGTTCGCG ACCCTAGTTT
 AGCTTCGACG TCCCAGGAAA AGCAAAGACC CCGTGGCTCC AATTCCCAAC AAAAACAGCA 1260
 TCGAAGCTGC AGGGTCCTTT TCGTTTCTGG GGCACCGAGG TTAAGGGTTG TTTTGTCTGT
 ATTCCAGACA AGCGCGTAGT TAGACTAACG GAAAGGTGTA TGGAACTCT ATGGACTTTG 1320
 TAAGGTCTGT TCGCGCATCA ATCTGATTGC CTTTCCACAT ACCTTTGAGA TACCTGAAAC
 AAATAAGAT TTGCATTGTT GGAAGAGCAA AAAAGAAATT GCACTACAGC ACGTTATATT 1380
 TTTGATTCTA AACGTAACAA CCTTCTCGTT TTTTCTTTAA CGTGATGTCG TGCAATATAA
 CTATTGTTTA CTACAAGAAG CTGGTTTAGT TGATTGTAGT TCTCCTTTCC TTCTTTTTTT 1440
 GATAACAAAT GATGTTCTTC GACCAATCA ACTAACATCA AGAGGAAAGG AAGAAAAAAA
 TTATAACTAT ATTTGCACGT GTTCCCAGGC AATTGTTTTA TTCAACTTCC AGTGACAGAG 1500
 AATATTGATA TAAACGTGCA CAAGGGTCCG TTAACAAAAT AAGTTGAAGG TCACTGTCTC
 CAGTGACTION ATGTCTCAGC CTAAAGAAGC TCAATTCATT TCTGATCAAC TAATGGTGAC 1560
 GTCAGTACT TACAGAGTCG GATTTCTTCG AGTTAAGTAA AGACTAGTTG ATTACCACTG
 AAGTGTGTTGA TACTTGGGGA AAGTGAATA ATTGCAATGG TAAATCAGAG AAAAGTTGAC 1620
 TTCACAACT ATGAACCCCT TTCACTTGAT TAACGTTACC ATTTAGTCTC TTTTCAACTG
 CAATGTTGCT TTTCCTGTAG ATGAACAAGT GAGAGATCAC ATTTAAATGA TGATCACTTT 1680
 GTTACAACGA AAAGGACATC TACTTGTTCA CTCTCTAGTG TAAATTTACT ACTAGTGAAA
 CCATTTAATA CTTTCAGCAG TTTTAGTTAG ATGACATGTA GGATGCACCT AAATCTAAAT 1740
 GGTAATTAT GAAAGTCGTC AAAATCAATC TACTGTACAT CCTACGTGGA TTTAGATTTA
 ATTTTATCAT AAATGAAGAG CTGGTTTAGA CTGTATGGTC ACTGTTGGGA AGGTAAATGC 1800
 TAAATAGTA TTTACTTCTC GACCAAATCT GACATACCAG TGACAACCCCT TCCATTACG
 CTACTTTGTC AATTCTGTTT TAAAAATTGC CTAAATAAAT ATTAAGTCCT AAATAAAAAA 1860
 GATGAAACAG TTAAGACAAA ATTTTAAACG GATTATTATA TAATTCAGGA TTTATTTTTT
 AAAAAAAAAA AAAAA
 TTTTTTTTTT TTTT

Fig. 4. (Continuation page 2, SEQ ID NO:4).

MLLLFRAIPM LLLGLMVLQT DCEIAQYYID EEEPPGTVIA VLSQHSIFNT TDIPATNFRL	60
MKQFNNSLIG VRES DGQLSI MERIDREQIC RQSLHCNLAL DVVSFSKGHF KLLNVKVEVR	120
DINDHSPHFP SEIMHVEVSE SSSVGTRIPL EIAIDEDVGS NSIQNFQISN NSHFSIDVLT	180
RADGVKYADL VLMRELDREI QPTYIMELLA MDGGVPSLSG TAVVNIRVLD FNDNSPVFER	240
STIAVDLVED APLGYLLEL HATDDDEGVN GEIVYGFSTL ASQEVRLFK INSRTGSVTL	300
EGQVDFETKQ TYEFEVQAQD LGNPPLTATC KVTVHILDVN DNTPAITITP LTTVNAGVAY	360
IPETATKENF IALISTDRA SGSNGQVRCT LYGHEHFKLQ QAYEDSYMIV TTSTLDRENI	420
AAYSLTVVAE DLGFPSLTKK KYITVKVSDE NDNA PVFSKP QYEASILENN APGSYITTVI	480
ARDSDSQNG KVNRYRLVDAK VMGQSLTTFV SLDADSGVLR AVRSLDYEKL KQLDFEIEAA	540
DNGIPQLSTR VQLNLRIVDQ NDNC PVITNP LLNNGSGEVL LPISAPQNYL VFQLKAEDSD	600
EGHNSQLFYT ILRDP SRLFA INKESGEVFL KKQLNSDHSE DLSIVVAVYD LGRPSLSTNA	660
TVKFILTDSF PSNVEVVILQ PSAEEQHQID MSIIFIAVLA GGCALLLLAI FFFVACTCKKK	720
AGEFKQVPEQ HGTCNEERLL STPSPQSVSS SLSQSESCQL SINTESENC SSSNQEQHQQ	780
TGIKHSISVP SYHTSGWHL D NCAMSISGHS HMGHISTKVQ WAKEIVTSMT VTLILVENQK	840
RRALSSQCRH KPV LNTQMNQ QGSDMPITIS ATESTRVQKM GTHACNMKRA IDCLTL	

Figure 5. Deduced amino acid sequence of the *Xenopus* PAPC (paraxial protocadherin) protein. It encodes a member of the cadherin family of transmembrane proteins that has dorsalizing activity when constructs are injected into *Xenopus* embryos. SEQ ID NO:5.

Figure 6. Nucleotide sequence of the full-length PAPC cDNA derived from the *Xenopus* organizer. The sense strand of the DNA is shown in the top line (in the 5' to 3' direction), and the bottom line shows the antisense strand (opposite orientation). SEQ ID NO:6.

GAATTCCCAG AGATGAACTC CTTGAGATTG TTTTAAATGA CTGCAGGTCT GGAAGGATTC	60
CTTAAGGGTC TCTACTTGAG GAACTCTAAC AAAATTTACT GACGTCCAGA CCTTCCTAAG	
ACATTGCCAC ACTGTTTCTA GGCATGAAAA AACTGCAAGT TTCAACTTTG TTTTGGGTGC	120
TGTAACGGTG TGACAAAGAT CCGTACTTTT TTGACGTTCA AAGTTGAAAC AAAAACCACG	
AACTTTGATT CTTCAAGATG CTGCTTCTCT TCAGAGCCAT TCCAATGCTG CTGTTGGGAC	180
TTGAAACTAA GAAGTTCTAC GACGAAGAGA AGTCTCGGTA AGGTTACGAC GACAACCTG	
TGATGGTTTT ACAACAGAC TGTGAAATTG CCCAGTACTA CATAGATGAA GAAGAACCCC	240
ACTACCAAAA TGTTTGCTG ACACTTTAAAC GGGTCATGAT GTATCTACTT CTTCTTGGGG	
CTGGCACTGT AATTGCAGTG TTGTCACAAC ACTCCATATT TAACACTACA GATATACCTG	300
GACCGTGACA TTAACGTCAC AACAGTGTTG TGAGGTATAA ATTGTGATGT CTATATGGAC	
CAACCAATTT CCGTCTAATG AAGCAATTTA ATAATTCCCT TATCGGAGTC CGTGAGAGTG	360
GTTGGTTAAA GGCAGATTAC TTCGTTAAAT TATTAAGGGA ATAGCCTCAG GCACTCTCAC	
ATGGGCAGCT GAGCATCATG GAGAGGATTG ACCGGGAGCA AATCTGCAGG CAGTCCCTTC	420
TACCCGTCGA CTCGTAGTAC CTCCTCTAAC TGGCCCTCGT TTAGACGTCC GTCAGGGAAG	
ACTGCAACCT GGCTTTGGAT GTGGTCAGCT TTTCCAAAGG ACACTTCAAG CTTCTGAACG	480
TGACGTTGGA CCGAAACCTA CACCAGTCGA AAAGGTTTCC TGTGAAGTTC GAAGACTTGC	
TGAAAGTGGA GGTGAGAGAC ATTAATGACC ATAGCCCTCA CTTTCCCAGT GAAATAATGC	540
ACTTTCACCT CCACTCTCTG TAATTACTGG TATCGGGAGT GAAAGGGTCA CTTTATTACG	
ATGTGGAGGT GTCTGAAAGT TCCTCTGTGG GCACCAGGAT TCCTTTAGAA ATTGCAATAG	600
TACACCTCCA CAGACTTTCA AGGAGACACC CGTGGTCCTA AGGAAATCTT TAACGTTATC	
ATGAAGATGT TGGGTCCAAC TCCATCCAGA ACTTTCAGAT CTCAAATAAT AGCCACTTCA	660
TACTTCTACA ACCCAGGTTG AGGTAGGTCT TGAAAGTCTA GAGTTTATTA TCGGTGAAGT	
GCATTGATGT GCTAACCAGA GCAGATGGGG TGAAATATGC AGATTTAGTC TTAATGAGAG	720
CGTAACTACA CGATTGGTCT CGTCTACCCC ACTTTATACG TCTAAATCAG AATTACTCTC	
AACTGGACAG GGAAATCCAG CCAACATACA TAATGGAGCT ACTAGCAATG GATGGGGGTG	780
TTGACCTGTC CCTTTAGGTC GGTGTATGT ATTACCTCGA TGATCGTTAC CTACCCCCAC	
TACCATCACT ATCTGGTACT GCAGTGGTTA ACATCCGAGT CCTGGACTTT AATGATAACA	840
ATGGTAGTGA TAGACCATGA CGTCACCAAT TGTAGGCTCA GGACCTGAAA TTACTATTGT	
GCCCAGTGTT TGAGAGAAGC ACCATTGCTG TGGACCTAGT AGAGGATGCT CCTCTGGGAT	900
CGGGTCACAA ACTCTCTTCG TGGTAACGAC ACCTGGATCA TCTCCTACGA GGAGACCCTA	
ACCTTTTGTT GGAGTTACAT GCTACTGACG ATGATGAAGG AGTGAATGGA GAAATTGTTT	960
TGAAAAACAA CCTCAATGTA CGATGACTGC TACTACTTCC TCACTTACCT CTTTAACAAA	
ATGGATTGAG CACTTTGGCA TCTCAAGAGG TACGTCAGCT ATTTAAATTT AACTCCAGAA	1020
TACCTAAGTC GTGAAACCGT AGAGTTCTCC ATGCAGTCGA TAAATTTTAA TTGAGGTCTT	

CTGGCAGTGT TACTCTTGAA GGCCAAGTTG ATTTTGAGAC CAAGCAGACT TACGAATTTG	1080
GACCGTCACA ATGAGAACTT CCGGTTCAAC TAAAACTCTG GTTCGTCTGA ATGCTTAAAC	
AGGTACAAGC CCAAGATTTG GGCCCCAACC CACTGACTGC TACTTGTAAG GTAAGTGTTC	1140
TCCATGTTTCG GGTTCCTAAC CCGGGGTTGG GTGACTGACG ATGAACATTT CATTGACAAG	
ATATACTTGA TGTAATGAT AATACCCAG CCATCACTAT TACCCCTCTG ACTACTGTAA	1200
TATATGAAGT ACATTTACTA TTATGGGGTC GGTAGTGATA ATGGGGAGAC TGATGACATT	
ATGCAGGAGT TGCCTATATT CCAGAAACAG CCACAAAGGA GAACTTTATA GCTCTGATCA	1260
TACGTCCTCA ACGGATATAA GGTCTTTGTC GGTGTTTCCT CTTGAAATAT CGAGACTAGT	
GCACTACTGA CAGAGCCTCT GGATCTAATG GACAAGTTTC CTGTACTCTT TATGGACATG	1320
CGTGATGACT GTCTCGGAGA CCTAGATTAC CTGTTCAAGC GACATGAGAA ATACCTGTAC	
AGCACTTTAA ACTACAGCAA GCTTATGAGG ACAGTTACAT GATAGTTACC ACCTCTACTT	1380
TCGTGAAATT TGATGTCGTT CGAATACTCC TGTCAATGTA CTATCAATGG TGGAGATGAA	
TAGACAGGGA AAACATAGCA GCGTACTCTT TGACAGTAGT TGCAGAAGAC CTTGGCTTCC	1440
ATCTGTCCCT TTTGTATCGT CGCATGAGAA ACTGTCATCA ACGTCTTCTG GAACCGAAGG	
CCTCATTGAA GACCAAAAAG TACTACACAG TCAAGGTTAG TGATGAGAAT GACAATGCAC	1500
GGAGTAACCT CTGGTTTTTC ATGATGTGTC AGTTCCAATC ACTACTCTTA CTGTTACGTG	
CTGTATTTTC TAAACCCAG TATGAAGCTT CTATTCTGGA AAATAATGCT CCAGGCTCTT	1560
GACATAAAAG ATTTGGGGTC ATACTTCGAA GATAAGACCT TTTATTACGA GGTCCGAGAA	
ATATAACTAC AGTGATAGCC AGAGACTCTG ATAGTGATCA AAATGGCAAA GTAAATTACA	1620
TATATTGATG TCACTATCGG TCTCTGAGAC TATCACTAGT TTTACCGTTT CATTTAATGT	
GACTTGTGGA TGCAAAAGTG ATGGGCCAGT CACTAACAAC ATTTGTTTCT CTTGATGCGG	1680
CTGAACACCT ACGTTTTTAC TACCCGGTCA GTGATTGTTG TAAACAAAGA GAACTACGCC	
ACTCTGGAGT ATTGAGAGCT GTTAGGTCTT TAGACTATGA AAAACTTAA CAACTGGATT	1740
TGAGACCTCA TAACTCTCGA CAATCCAGAA ATCTGATACT TTTTGAATTT GTTGACCTAA	
TTGAAATTGA AGCTGCAGAC AATGGGATCC CTCAACTCTC CACTCGCGTT CAACTAAATC	1800
AACTTTAACT TCGACGCTG TTACCCTAGG GAGTTGAGAG GTGAGCGCAA GTTGATTAG	
TCAGAATAGT TGATCAAAAT GATAATTGCC CTGTGATAAC TAATCCTCTT CTTAATAATG	1860
AGTCTTATCA ACTAGTTTTA CTATTAACGG GACACTATTG ATTAGGAGAA GAATTATTAC	
GCTCGGGTGA AGTTCTGCTT CCCATCAGCG CTCCTCAAAA CTATTTAGTT TTCCAGCTCA	1920
CGAGCCCACT TCAAGACGAA GGGTAGTCGC GAGGAGTTTT GATAAATCAA AAGGTCGAGT	
AAGCGAGGA TTCAGATGAA GGGCACAACT CCCAGCTGTT CTATACCATA CTGAGAGATC	1980
TTCGGCTCCT AAGTCTACTT CCCGTGTTGA GGGTCGACAA GATATGGTAT GACTCTCTAG	
CAAGCAGATT GTTTGCCATT AACAAAGAAA GTGGTGAAGT GTTCCTGAAA AAACAATTAA	2040
GTTCGTCTAA CAAACGGTAA TTGTTTCTTT CACCACTTCA CAAGGACTTT TTTGTTAATT	
ACTCTGACCA TTCAGAGGAC TTGAGCATAG TAGTTGCAGT GTATGACTTG GGAAGACCTT	2100
TGAGACTGGT AAGTCTCCTG AACTCGTATC ATCAACGTCA CATACTGAAC CCTTCTGGAA	
CATTATCCAC CAATGCTACA GTTAAATTCA TCCTCACCGA CTCTTTTCCT TCTAACGTTG	2160
GTAATAGGTG GTTACGATGT CAATTTAAGT AGGAGTGGCT GAGAAAAGGA AGATTGCAAC	

Fig. 6. (Continuation page 2, SEQ ID NO:6).

AAGTCGTTAT TTTGCAACCA TCTGCAGAAG AGCAGCACCA GATCGATATG TCCATTATAT	2220
TTCAGCAATA AAACGTTGGT AGACGTCCTC TCGTCGTGGT CTAGCTATAC AGGTAATATA	
TCATTGCAGT GCTGGCTGGT GGTGTGTGCTT TGCTACTTTT GGCCATCTTT TTTGTGGCCT	2280
AGTAACGTCA CGACCGACCA CCAACACGAA ACGATGAAAA CCGGTAGAAA AAACACCGGA	
GTAATTGTAA AAAGAAAGCT GGTGAATTTA AGCAGGTACC TGAACAACAC GGAACATGCA	2340
CATGAACATT TTTCTTTTGA CCACTTAAAT TCGTCCATGG ACTTGTTGTG CCTTGTACGT	
ATGAAGAACG CCTGTTAAGC ACCCCATCTC CCCAGTCGGT CTCTTCTTCT TTGTCTCAGT	2400
TACTTCTTGC GGACAATTCTG TGGGGTAGAG GGGTCAGCCA GAGAAGAAGA AACAGAGTCA	
CTGAGTCATG CCAACTCTCC ATCAATACTG AATCTGAGAA TTGCAGCGTG TCCTCTAACC	2460
GACTCAGTAC GGTTGAGAGG TAGTTATGAC TTAGACTCTT AACGTCGCAC AGGAGATTGG	
AAGAGCAGCA TCAGCAAACA GGCATAAAGC ACTCCATCTC TGTACCATCT TATCACACAT	2520
TTCTCGTCGT AGTCGTTTGT CCGTATTTCTG TGAGGTAGAG ACATGGTAGA ATAGTGTGTA	
CTGGTTGGCA CCTGGACAAT TGTGCAATGA GCATAAGTGG ACATTCTCAC ATGGGGCACA	2580
GACCAACCGT GGACCTGTTA ACACGTTACT CGTATTCACC TGTAAGAGTG TACCCCGTGT	
TTAGTACAAA GGTACAGTGG GCAAAGGAGA TAGTGACTTC AATGACAGTG ACTCTGATAC	2640
AATCATGTTT CCATGTCACC CGTTTCCTCT ATCACTGAAG TTACTGTCAC TGAGACTATG	
TAGTGGAGAA TCAGAAAAGA AGAGCATTGA GCAGCCAATG CAGGCACAAG CCAGTGCTCA	2700
ATCACCTCTT AGTCTTTTCT TCTCGTAACT CGTCGGTTAC GTCCGTGTTT GGTACAGAGT	
ATACACAGAT GAATCAGCAG GGTCCGACA TGCCGATAAC TATTTAGCC ACCGAATCAA	2760
TATGTGTCTA CTTAGTCGTC CCAAGGCTGT ACGGCTATTG ATAAAGTCGG TGGCTTAGTT	
CAAGGGTCCA GAAATGGGA ACTGCACATT GCAATATGAA AAGGGCTATA GACTGTCTTA	2820
GTTCCAGGT CTTTACCCT TGACGTGTA CGTTATACTT TTCCCGATAT CTGACAGAAT	
CTCTGTAGCT CCTGTATATT ACAATACCTA CCATGCAAGA ATGCCTAACC TGCACATACC	2880
GAGACATCGA GGACATATAA TGTTATGGAT GGTACGTTCT TACGGATTGG ACGTGTATGG	
GAACCATACC CTTAGAGACC CTTATTACCA TATCAATAAT CCTGTTGCTA ATCGGATGCA	2940
CTTGGTATGG GAATCTCTGG GAATAATGGT ATAGTTATTA GGACAACGAT TAGCCTACGT	
GGCGGAATAT GAAAGAGATT TAGTCAACAG AAGTGCAACG TTATCTCCGC AGAGATCGTC	3000
CCGCCTTATA CTTTCTCTAA ATCAGTTGTC TTCACGTTGC AATAGAGGCG TCTCTAGCAG	
TAGCAGATAC CAAGAATTCA ATTACAGTCC GCAGATATCA AGACAGCTTC ATCCTTCAGA	3060
ATCGTCTATG GTTCTTAAGT TAATGTCAGG CGTCTATAGT TCTGTGGAAG TAGGAAGTCT	
AATTGCTACA ACCTTTTAAAT CATTAGGCAT GCAAGTGAGA ATGCACAAAG GCAAGTGCTT	3120
TTAACGATGT TGGAAAATTA GTAATCCGTA CGTTCACTCT TACGTGTTT CGTTCACGAA	
TAGCATGAAA GCTAAATATA TGGAGTCTCC CCTTTCCCTC TGATGGATGG GGGGAGACAC	3180
ATCGTACTTT CGATTTATAT ACCTCAGAGG GGAAAGGGAG ACTACCTACC CCCCTCTGTG	
AGGACAGTGC ATAAATATAC AGCTGCTTTC TATTTGCATT TCACTGGGA ATTTTTGTG	3240
TCCTGTCACG TATTTATATG TCGACGAAAG ATAAACGTAA AGTGAACCCT TAAAAACAA	
TTTTTTACAT ATTTATTTTT CCTGAATTGA ATGTGACATT GTCCTGTCAC CTAAGTAGCA	3300
AAAAAATGTA TAAATAAAAA GGAAGTAACT TAACTGTAA CAGGACAGTG GATTGATCGT	

Fig. 6. (Continuation page 3, SEQ ID NO:6).

ATTAAATCCA	CAGACCTACA	GTCAAATATT	TGAGGGCCCC	TGAAACAGCA	CATCAGTCAG	3360
TAATTTAGGT	GTCTGGATGT	CAGTTTATAA	ACTCCCGGGG	ACTTTGTCGT	GTAGTCAGTC	
GACCTAAAGT	GGCCTTTTTA	CTTTTAGCAG	CTCCTGGGTC	TGCCCTCTGT	GTTAATCAGC	3420
CTGGATTTCA	CCGGA AAAAT	GAAAATCGTC	GAGGACCCAG	ACGGGAGACA	CAATTAGTCG	
CCCTGGTCAA	GTCCTGAGTA	GGATCATGGC	GTTTTTATAT	GCATCTCACC	TACTTTGGAC	3480
GGGACCAGTT	CAGGACTCAT	CCTAGTACCG	CAAAAATATA	CGTAGAGTGG	ATGAAACCTG	
GTGATTTACA	CATAATAGGA	AACGCTTGGT	TTCAGTGAAG	TCTGTGTTGT	ATATATTCTG	3540
CACTAAATGT	GTATTATCCT	TTGCGAACCA	AAGTCACTTC	AGACACAACA	TATATAAGAC	
TTATATACAC	GCATTTTGTG	TTTGTGTATA	TATTTCAAGT	CCATTCAGAT	ATGTGTATAT	3600
AATATATGTG	CGTAAACAC	AAACACATAT	ATAAAGTTCA	GGTAAGTCTA	TACACATATA	
AGTGCAGACC	TTGTAAATTA	AATATTCTGA	TACTTTTCC	TCAATAAATA	TTTAAAT	
TCACGTCTGG	AACATTTAAT	TTATAAGACT	ATGAAAAAGG	AGTTATTAT	AAATTTA	

Fig. 6. (Continuation page 4, SEQ ID NO:6).

MVCCGPGRML LGWAGLLVLA ALCLLQVPGA QAAACEPVRI PLCKSLPWNM TKMPNHLHHS 60
TQANAILAME QFEGLLGTHC SPDLLFFLCA MYAPICTIDF QHEPIKPCKS VCERARQGCE 120
PILIKYRHSW PESLACDELP VYDRGVCISP EAIVTADGAD FPMDSSTGHC RGASSERCKC 180
KPVRATQKTY FRNNYNYVIR AKVKEVKMKC HDVTAVVEVK EILKASLVNI PRDTVNLYTT 240
SGCLCPPLTV NEEYVIMGYE DEERSRLLLV EGSIAEKWKD RLGKKVKRWD MKLRHLGLGK 300
TDASDSTQNQ KSGRNSNPRP ARS.

Figure 7. Deduced amino acid sequence of mouse FRZB-1 protein. SEQ ID NO:7.

Figure 8. Nucleotide sequence of the full-length mouse FRZB-1 cDNA. SEQ ID NO:8.

AAGCCTGGGA CCATGGTCTG CTGCGGCCCG GGACGGATGC TGCTAGGATG GGCCGGGTTG	60
TTCGGACCCT GGTACCAGAC GACGCCGGGC CCTGCCTACG ACGATCCTAC CCGGCCCAAC	
CTAGTCCTGG CTGCTCTCTG CCTGCTCCAG GTGCCCCGAG CTCAGGCTGC AGCCTGTGAG	120
GATCAGGACC GACGAGAGAC GGACGAGGTC CACGGGCCTC GAGTCCGACG TCGGACACTC	
CCTGTCCGCA TCCCCGTGTG CAAGTCCCTT CCCTGGAACA TGACCAAGAT GCCCAACCAC	180
GGACAGGCGT AGGGCGACAC GTTCAGGGAA GGGACCTTGT ACTGGTTCTA CGGGTTGGTG	
CTGCACCACA GCACCCAGGC TAACGCCATC CTGGCCATGG AACAGTTCGA AGGGCTGCTG	240
GACGTGGTGT CGTGGGTCCG ATTGCGGTAG GACCGGTACC TTGTCAAGCT TCCCACGAC	
GGCACCCTACT GCAGCCCGGA TCTTCTCTTC TTCCTCTGTG CAATGTACGC ACCCATTTGC	300
CCGTGGGTGA CGTCGGGCCT AGAAGAGAAG AAGGAGACAC GTTACATGCG TGGGTAAACG	
ACCATCGACT TCCAGCACGA GCCCATCAAG CCCTGCAAGT CTGTGTGTGA GCGCGCCCGA	360
TGGTAGCTGA AGGTCGTGCT CGGGTAGTTC GGGACGTTCA GACACACACT CGCGCGGGCT	
CAGGGCTGCG AGCCCATTTCT CATCAAGTAC CGCCACTCGT GGCCGGAAAAG CTTGGCCTGC	420
GTCCCAGCGC TCGGGTAAGA GTAGTTCATG GCGGTGAGCA CCGGCCTTTC GAACCGGACG	
GACGAGCTGC CGGTGTACGA CCGCGGCGTG TGCATCTCTC CTGAGGCCAT CGTCACCGCG	480
CTGCTCGACG GCCACATGCT GGCGCCGCAC ACGTAGAGAG GACTCCGGTA GCAGTGGCGC	
GACGGAGCGG ATTTTCCTAT GGATTCAAGT ACTGGACACT GCAGAGGGGC AAGCAGCGAA	540
CTGCCTCGCC TAAAAGGATA CCTAAGTTCA TGACCTGTGA CGTCTCCCCG TTCGTCGCTT	
CGTTGCAAAT GTAAGCCTGT CAGAGCTACA CAGAAGACCT ATTTCCGGAA CAATTACAAC	600
GCAACGTTTA CATTCGGACA GTCTCGATGT GTCTTCTGGA TAAAGGCCTT GTTAATGTTG	
TATGTCATCC GGGCTAAAGT TAAAGAGGTA AAGATGAAAT GTCATGATGT GACCGCCGTT	660
ATACAGTAGG CCCGATTTCA ATTTCTCCAT TTCTACTTTA CAGTACTACA CTGGCGGCAA	
GTGGAAGTGA AGGAAATTCT AAAGGCATCA CTGGTAAACA TTCCAAGGGA CACCGTCAAT	720
CACCTTCACT TCCTTTAAGA TTTCCGTAGT GACCATTGTG AAGGTTCCCT GTGGCAGTTA	
CTTTATACCA CCTCTGGCTG CCTCTGTCCT CCACTTACTG TCAATGAGGA ATATGTCATC	780
GAAATATGGT GGAGACCGAC GGAGACAGGA GGTGAATGAC AGTTACTCCT TATACAGTAG	
ATGGGCTATG AAGACGAGGA ACGTTCCAGG TTA CTCTTGG TAGAAGGCTC TATAGCTGAG	840
TACCCGATAC TTCTGCTCCT TGCAAGGTCC AATGAGAACC ATCTTCCGAG ATATCGACTC	
AAGTGGAAGG ATCGGCTTGG TAAGAAAGTC AAGCGCTGGG ATATGAAACT CCGACACCTT	900
TTACCTTCC TAGCCGAACC ATTCTTTCAG TTCGCGACCC TATACTTTGA GGCTGTGGAA	
GGACTGGGTA AACTGATGC TAGCGATTCC ACTCAGAATC AGAAGTCTGG CAGGAACCTC	960
CCTGACCCAT TTTGACTACG ATCGCTAAGG TGAGTCTTAG TCTTCAGACC GTCCTTGAGA	

AATCCCCGGC CAGCACGCAG CTAAATCCTG AAATGTAAAA GGCCACACCC ACGGACTCCC 1020
TTAGGGGCCG GTCGTGCGTC GATTTAGGAC TTTACATTTT CCGGTGTGGG TGCCTGAGGG

TTCTAAGACT GGCGCTGGTG GACTAACAAA GGAAAACCGC ACAGTTGTGC TCGTGACCGA 1080
AAGATTCTGA CCGCGACCAC CTGATTGTTT CCTTTTGGCG TGTCAACACG AGCACTGGCT

TTGTTTACCG CAGACACCGC GTGGCTACCG AAGTTACTTC CGGTCCCCTT TCTCCTGCTT 1140
AACAAATGGC GTCTGTGGCG CACCGATGGC TTCAATGAAG GCCAGGGGAA AGAGGACGAA

CTTAATGGCG TGGGGTTAGA TCCTTTAATA TGTATATAT TCTGTTTCAT CAATCACGTG 1200
GAATTACCGC ACCCCAATCT AGGAAATTAT ACAATATATA AGACAAAGTA GTTAGTGCAC

GGGACTGTTT TTTTGCAACC AGAATAGTAA ATTAATATG TTGATGCTAA GGTTCCTGTA 1260
CCCTGACAAG AAAACGTTGG TCTTATCATT TAATTTATAC AACTACGATT CCAAAGACAT

CTGGACTCCC TGGGTTTAAT TTGGTGTCT GTACCCTGAT TGAGAATGCA ATGTTTCATG 1320
GACCTGAGGG ACCCAAATTA AACCACAAGA CATGGGACTA ACTCTTACGT TACAAAGTAC

TAAAGAGAGA ATCCTGGTCA TATCTCAAGA ACTAGATATT GCTGTAAGAC AGCCTCTGCT 1380
ATTTCTCTCT TAGGACCAGT ATAGAGTTCT TGATCTATAA CGACATTCTG TCGGAGACGA

GCTGCGCTTA TAGTCTTGTG TTTGTATGCC TTTGTCCATT TCCCTCATGC TGTGAAAGTT 1440
CGACGCGAAT ATCAGAACAC AAACATACGG AAACAGGTAA AGGGAGTACG ACACTTTCAA

ATACATGTTT ATAAAGGTAG AACGGCATT TGAATCAGA CACTGCACAA GCAGAGTAGC 1500
TATGTACAAA TATTTCCATC TTGCCGTAAA ACTTTAGTCT GTGACGTGTT CGTCTCATCG

CCAACACCAG GAAGCATTTA TGAGGAAACG CCACACAGCA TGACTTATTT TCAAGATTGG 1560
GGTTGTGGTC CTTTCGTAAAT ACTCCTTTGC GGTGTGTCGT ACTGAATAAA AGTTCTAACC

CAGGCAGCAA AATAAATAGT GTTGGGAGCC AAGAAAAGAA TATTTTGCCT GGTAAAGGGG 1620
GTCCGTCGTT TTATTTATCA CAACCCTCGG TTCTTTTCTT ATAAAACGGA CCAATTCCCC

CACACTGGAA TCAGTAGCCC TTGAGCCATT AACAGCAGTG TTCTTCTGGC AAGTTTTTGA 1680
GTGTGACCTT AGTCATCGGG AACTCGGTAA TTGTCGTCAC AAGAAGACCG TTCAAAAAC

TTTGTTTATA AATGTATTCA CGAGCATTAG AGATGAACCT ATAAC TAGAC ATCTGTTGTT 1740
AAACAAGTAT TTACATAAGT GCTCGTAATC TCTACTTGAA TATTGATCTG TAGACAACAA

ATCTCTATAG CTCTGCTTCC TTCTAAATCA AACCATTGT TGGATGCTCC CTCTCCATTC 1800
TAGAGATATC GAGACGAAGG AAGATTTAGT TTGGGTAACA ACCTACGAGG GAGAGGTAAG

ATAAATAAAT	TTGGCTTGCT	GTATTGGCCA	GGAAAAGAAA	GTATTAAAGT	ATGCATGCAT	1860
TATTTATTTA	AACCGAACGA	CATAACCGGT	CCTTTTCCTT	CATAATTTCA	TACGTACGTA	
GTGCACCAGG	GTGTTATTTA	ACAGAGGTAT	GTAACCTCTAT	AAAAGACTAT	AATTTACAGG	1920
CACGTGGTCC	CACAATAAAT	TGTCTCCATA	CATTGAGATA	TTTTCTGATA	TTAAATGTCC	
ACACGGAAAT	GTGCACATTT	GTTTACTTTT	TTTCTTCCTT	TTGCTTTGGG	CTTGTGATTT	1980
TGTGCCTTTA	CACGTGTAAA	CAAATGAAAA	AAAGAAGGAA	AACGAAACCC	GAACACTAAA	
TGGTTTTTGG	TGTGTTTATG	TCTGTATTTT	GGGGGGTGGG	TAGGTTTAAG	CCATTGCACA	2040
ACCAAAAACC	ACACAAATAC	AGACATAAAA	CCCCCACC	ATCCAAATTC	GGTAACGTGT	
TTCAAGTTGA	ACTAGATTAG	AGTAGACTAG	GCTCATTGGC	CTAGACATTA	TGATTTGAAT	2100
AAGTTCAACT	TGATCTAATC	TCATCTGATC	CGAGTAACCG	GATCTGTAAT	ACTAACTTA	
TTGTGTTGTT	TAATGCTCCA	TCAAGATGTC	TAATAAAAGG	AATATGGTTG	TCAACAGAGA	2160
AACACAACAA	ATTACGAGGT	AGTTCTACAG	ATTATTTTCC	TTATACCAAC	AGTTGTCTCT	
CGACAACAAC	AACAAA					
GCTGTTGTTG	TTGTTT					

MVCGSPGGML LLRAGLLALA ALCLLRVPGA RAAACEPVRI PLCKSLPWNM TKMPNHLHHS 60
TQANAILAIE QFEGLLGTHC SPDLLFFLCA MYAPICTIDF QHEPIKPCKS VCERARQGCE 120
PILIKYRHSW PENLACEELP VYDRGVCISP EAIVTADGAD FPMDSNGNC RGASSERCKC 180
KPIRATQKTY FRNNYNYVIR AKVKEIKTKC HDVTAVVEVK EILKSSLVNI PRDTVNLITS 240
SGCLCPPLNV NEEYIIMGYE DEERSRLLLV EGSIAEKWKD RLGKKVKRWD MKLRHLGLSK 300
SDSSNSDSTQ SQKSGRNSNP RQARN.

Figure 9. Deduced amino acid sequence of human FRZB-1 protein. SEQ ID NO:9.

Figure 10. Nucleotide sequence of the full-length human FRZB-1 cDNA. SEQ ID NO:10.
This sequence was assembled from public ESTs from the Genbank database
(accession numbers: H18848, R63748, W38677, W44760, H38379 and N71244).

```

GGCGGAGCGG GCCTTTTGGC GTCCACTGCG CGGCTGCACC CTGCCCCATC TGCCGGGATC      60
CCGCCTCGCC CGGAAAACCG CAGGTGACGC GCCGACGTGG GACGGGGTAG ACGGCCCTAG

ATGGTCTGCG GCAGCCCGGG AGGGATGCTG CTGCTGCGGG CCGGGCTGCT TGCCCTGGCT      120
TACCAGACGC CGTCGGGCCC TCCCTACGAC GACGACGCCC GGCCCGACGA ACGGGACCGA

GCTCTCTGCC TGCTCCGGGT GCCCGGGGCT CGGGCTGCAG CCTGTGAGCC CGTCCGCATC      180
CGAGAGACGG ACGAGGCCCA CGGGCCCCGA GCCCGACGTC GGACACTCGG GCAGGCGTAG

CCCCGTGTGCA AGTCCCTGCC CTGGAACATG ACTAAGATGC CCAACCACCT GCACCACAGC      240
GGGGACACGT TCAGGGACGG GACCTTGTAC TGATTCTACG GGTGTTGGTGA CGTGGTGTCTG

ACTCAGGCCA ACGCCATCCT GGCCATCGAG CAGTTCGAAG GTCTGCTGGG CACCCACTGC      300
TGAGTCCGGT TGCGGTAGGA CCGGTAGCTC GTCAAGCTTC CAGACGACCC GTGGGTGACG

AGCCCCGATC TGCTCTTCTT CCTCTGTGCC ATGTACGCGC CCATCTGCAC CATTGACTTC      360
TCGGGGCTAG ACGAGAAGAA GGAGACACGG TACATGCGCG GGTAGACGTG GTAAGTGAAG

CAGCACGAGC CCATCAAGCC CTGTAAGTCT GTGTGCGAGC GGGCCCGGCA GGGCTGTGAG      420
GTCGTGCTCG GGTAGTTCGG GACATTGAGA CACACGCTCG CCCGGGCCGT CCCGACACTC

CCCATACTCA TCAAGTACCG CCACTCGTGG CCGGAGAACC TGGCCTGCGA GGAGCTGCCA      480
GGGTATGAGT AGTTCATGGC GGTGAGCACC GGCCTCTTGG ACCGGACGCT CCTCGACGGT

GTGTACGACA GGGGCGTGTG CATCTCTCCC GAGGCCATCG TTAAGTGCAG CAGGAGCTGAT      540
CACATGCTGT CCGCGCACAC GTAGAGAGGG CTCCGGTAGC AATGACGCCT GCCTCGACTA

TTTCCTATGG ATTCTAGTAA CGGAACTGT AGAGGGGCAA GCAGTGAACG CTGTAAATGT      600
AAAGGATACC TAAGATCATT GCCTTTGACA TCTCCCCGTT CGTCACTTGC GACATTTACA

AAGCCTATTA GAGCTACACA GAAGACCTAT TTCCGGAACA ATTACAACCT TGTCATTTCGG      660
TTCCGATAAT CTCGATGTGT CTTCTGGATA AAGGCCTTGT TAATGTTGAT ACAGTAAGCC

GCTAAAGTTA AAGAGATAAA GACTAAGTGC CATGATGTGA CTGCAGTAGT GGAGGTGAAG      720
CGATTTCAAT TTCTCTATTT CTGATTCACG GTACTACACT GACGTCATCA CCTCCACTTC

GAGATTCTAA AGTCCTCTCT GGTAACATT CCACGGGACA CTGTCAACCT CTATACCAGC      780
CTCTAAGATT TCAGGAGAGA CCATTTGTAA GGTGCCCTGT GACAGTTGGA GATATGGTCCG

TCTGGCTGCC TCTGCCCTCC ACTTAATGTT AATGAGGAAT ATATCATCAT GGGCTATGAA      840
AGACCGACGG AGACGGGAGG TGAATTACAA TTAAGCTTAA TATAGTAGTA CCCGATACTT

```

GATGAGGAAC GTTCCAGATT ACTCTTGGTG GAAGGCTCTA TAGCTGAGAA GTGGAAGGAT	900
CTACTCCTTG CAAGGTCTAA TGAGAACCAC CTTCCGAGAT ATCGACTCTT CACCTTCCTA	
CGACTCGGTA AAAAAGTTAA GCGCTGGGAT ATGAAGCTTC GTCATCTTGG ACTCAGTAAA	960
GCTGAGCCAT TTTTCAATT CGCGACCCTA TACTTCGAAG CAGTAGAACC TGAGTCATTT	
AGTGATTCTA GCAATAGTGA TTCCACTCAG AGTCAGAAGT CTGGCAGGAA CTCGAACCCC	1020
TCACTAAGAT CGTTATCACT AAGGTGAGTC TCAGTCTTCA GACCGTCCTT GAGCTTGGGG	
CGGCAAGCAC GCAACTAAAT CCCGAAATAC AAAAAGTAAC ACAGTGGACT TCCTATTAAG	1080
GCCGTTTCGTG CGTTGATTTA GGGCTTTATG TTTTTCATTG TGTCACCTGA AGGATAATTC	
ACTTACTTGC ATTGCTGGAC TAGCAAAGGA AAATTGCACT ATTGCACATC ATATTCTATT	1140
TGAATGAACG TAACGACCTG ATCGTTTCCT TTTAACGTGA TAACGTGTAG TATAAGATAA	
GTTTACTATA AAAATCATGT GATAACTGAT TATTACTTCT GTTCTCTTTT TGGTTTCTGC	1200
CAAATGATAT TTTTAGTACA CTATTGACTA ATAATGAAGA CAAAGAGAAA ACCAAAGACG	
TTCTCTCTTC TCTCAACCCC TTTGTAATGG TTTGGGGGCA GACTCTTAAG TATATTGTGA	1260
AAGAGAGAAG AGAGTTGGGG AAACATTACC AAACCCCCGT CTGAGAATTC ATATAACACT	
GTTTTCTATT TCACTAATCA TGAGAAAAAC TGTTCCTTTTG CAATAATAAT AAATTAAACA	1320
CAAAGATAA AGTGATTAGT ACTCTTTTGT ACAAGAAAAC GTTATTATTA TTTAATTTGT	
TGCTGTTACC AGAGCCTCTT TGCTGAGTCT CCAGATGTTA ATTTACTTTC TGCACCCCAA	1380
ACGACAAATGG TCTCGGAGAA ACGACTCAGA GGTCTACAAT TAAATGAAAG ACGTGGGGTT	
TTGGGAATGC AATATTGGAT GAAAAGAGAG GTTCTTG GTA TTCACAGAAA GCTAGATATG	1440
AACCTTACG TTATAACCTA CTTTTCTCTC CAAAGACCAT AAGTGTCTTT CGATCTATAC	
CCTTAAACA TACTCTGCCG ATCTAATTAC AGCCTTATTT TTGTATGCCT TTTGGGCATT	1500
GGAATTTTGT ATGAGACGGC TAGATTAAATG TCGGAATAAA AACATACGGA AAACCCGTAA	
CTCCTCATGC TTAGAAAGTT CCAAATGTTT ATAAAGGTAA AATGGCAGTT TGAAGTCAAA	1560
GAGGAGTACG AATCTTTCAA GGTTTACAAA TATTTCATT TTACCGTCAA ACTTCAGTTT	
TGTCACATAG GCAAAGCAAT CAAGCACCAG GAAGTGTTTA TGAGGAAACA ACACCCAAGA	1620
ACAGTGTATC CGTTTCGTTA GTTCGTGGTC CTTCAAAAT ACTCCTTTGT TGTGGGTTCT	
TGAATTATTT TTGAGACTGT CAGGAAGTAA AATAAATAGG AGCTTAAGAA AGAACATTTT	1680
ACTTAATAAA AACTCTGACA GTCCTTCATT TTATTTATCC TCGAATTCTT TCTTGTAATAA	
GCCTGATTGA GAAGCACAAC TGAAACCAGT AGCCGCTGGG GTGTTAATGG TAGCATTCTT	1740
CGGACTAACT CTTCTGTGTT ACTTTGGTCA TCGGCGACCC CACAATTACC ATCGTAAGAA	
CTTTTGGCAA TACATTTGAT TTGTTTCATGA ATATATTAAT CAGCATTAGA GAAATGAATT	1800
GAAAACCGTT ATGTAAACTA AACAAGTACT TATATAATTA GTCGTAATCT CTTTACTTAA	
ATAACTAGAC ATCTGCTGTT ATCACCATAG TTTTGTTTAA TTTGCTTCCT TTTAAATAAA	1860
TATTGATCTG TAGACGACAA TAGTGGTATC AAAACAAATT AAACGAAGGA AAATTTATTT	
CCCATTGGTG AAAGTCAAAA AAAAAAAAAA AAA	
GGGTAACCAC TTTCAGTTTT TTTTTTTTTT TTT	